

MICRO WELD

MODEL AUF-8
HEAVY DUTY
FERROUS

BUTT WELDERS

MICRO PRODUCTS COMPANY

SERVICE MANUAL

TABLE OF CONTENTS

1.0	SPECIFICATIONS
2.0	GENERAL OPERATING INSTRUCTIONS
3.0	BASIC OPERATING PARTS
4.0	BASIC OPERATING PARTS LOCATION
5.0	TYPICAL OPERATING SEQUENCE
6.0	SPECIAL ADJUSTMENTS
7.0	PREVENTIVE MAINTENANCE
8.0	SUGGESTED SETTINGS
9.0	DIAGNOISTIC CHART FOR TROUBLE-SHOOTING
10.0	ELECTRICAL SCHEMATIC
11.0	SAFETY REMINDERS
12.0	BUYERS GUIDE
13.0	PARTS LIST

1.0 SPECIFICATIONS MODEL AUF-8

Welding Range Steel Wire	.500 to 1.312 in. dia.	
Maximum Line Demand 460 Volt	137amps@100% duty cycle 433amps@10% duty cycle	
Maximum Line Demand 230 Volt	274amps@100% duty cycle 866amps@10% duty cycle	
Single Phase AC Transformer	90 KVA @ 50% duty cycle	
Clamp Method	Pneumatic, Foot Controlled	
Upset Method	Pneumatic, Adjustable	
Mounting	4-Caster Wheels	

Dimensions and Weights

Height Overall	50 in.	
Floor Space	62 in. x 36 in.	
Welding Die Height	43 in.	
Weight	1700 LBS	

FEATURES

- Micro Weld quality and workmanship
- Heavy-duty construction & components
- Easy to operate controls
- Low maintenance costs
- Easy to set welding parameters
- Safety electrical switch circuits
- Heavy-duty weld heat selection switch
- Sensitive straight slide movable headpiece assembly

2.0 GENERAL OPERATING INSTRUCTIONS

2.1 ELECTRICAL HOOK-UP INSTRUCTIONS

First determine that available electrical service in your plant corresponds to the nameplate rating located on welder housing. Electrical wiring to welder must be of sufficient size to deliver full ampere load with no appreciable loss during weld cycle. The welder will not operate properly if there is more than a 10% variation in the line voltage. In general, the welder should be fused with a slow blow fuse of the 100% duty cycle rating. The minimum power cable size to the welder can be obtained by using this same current rating.

Refer to National Electrical Code and local electrical regulations for adequate power sizes; disconnect methods and fusing guidelines.

Remember, line voltages to the welding machine are potentially dangerous should the power cords be damaged or severed. The welding voltages at the welding dies will not harm an operator since they do not exceed 10 volts.

2.2 SAFETY PRECAUTIONS (See section 11.0)

2.2.1 ELECTRICAL

Maintain electrical cable to welder in good repair. Welder must be grounded and connections securely tightened. Heat Switch must not be changed to new position while a weld cycle is in process. Disconnect electrical service before servicing welder - high voltages are located within the base of the welder.

2.2.2 MECHANICAL

Operator while using welder must wear safety glasses. Keep all safety guards on welders and use properly. Operators must be instructed on basic operation of unit to prevent injury. Check nameplate rating and keep within material size range for each welder.

2.3 WATER HOOK-UP (If so equipped)

It is important that if a welder is to be operated for an extended period of time and head heat up, water lines must be connected to the welder. Connect hoses to inlet and outlet provided at the back of the welder. Shut-off valve should be installed in the inlet line and the hose from the outlet should run to an open sight drain. Water should be turned off when welder is not in use.

2.4 AIR HOOK-UP

Set air regulators for from 20 to 80 lbs. A safety pop-off valve will be activated when air gauge is set for over 100 lbs.

2.5 WELDING DIES

The dies and shoes supplied with the welder will handle most size and material types within the range of the welder. For new weld applications consult the factory for special die and shoe sets.

3.0 BASIC OPERATING PARTS

3.1 MODEL AUF-8

3.1.1 WELD HEAT SELECTION SWITCH

Welding heat is selected by means of a heavy-duty tap switch with either eight or twelve steps of voltage. Number one indicates the highest heat setting and number eight or twelve indicates the lowest heat setting. The switch is conveniently located on the lower front of the welder.

Note: The following items can be located on Print #B 7771 in Section 9.1.A.

3.1.2 HEADPIECE CLOSED SPACE ADJUSTING BOLT

The closed space-adjusting bolt is located on the movable headpiece end plate. Refer to Item A.

3.1.3 HEADPIECE OPEN SPACE ADJUSTING BOLT

The open space-adjusting bolt is located on the upset mechanism. Refer to Item E.

3.1.4 LIMIT SWITCH ADJUSTING BOLT

The limit switch-adjusting bolt is located on the lever bar on the upset mechanism. Refer to Item F.

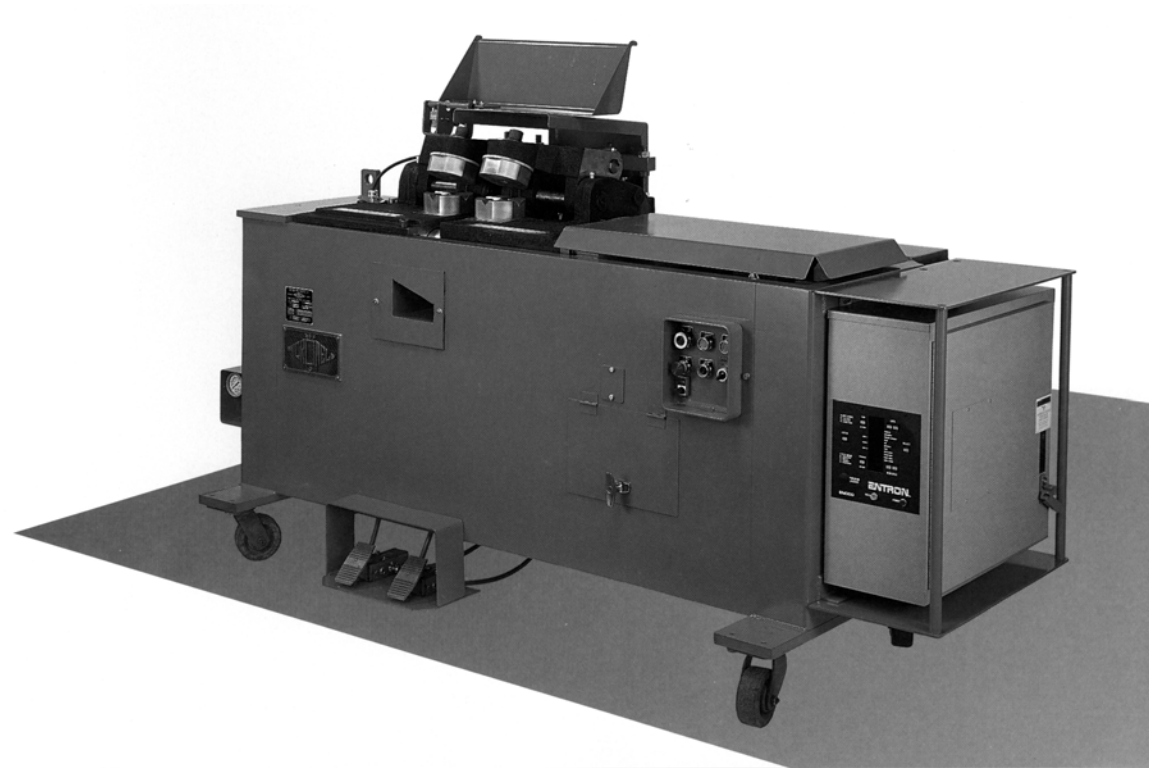
3.1.5 TOGGLE LINK

The toggle link is located on the upset mechanism. Refer to Item I.

3.1.6 UPSET LEVER ARM

The upset lever arm is located in the middle of the upset mechanism. Refer to Item I.

4.0 BASIC OPERATING PARTS LOCATION



5.0 TYPICAL OPERATING SEQUENCE

All insulating materials must be removed from conductors where they contact lower welding dies.

- 5.1** Set weld heat selection switch to recommended chart setting.
- 5.2** Set upset pressure to recommended chart setting (PSI).
- 5.3** Adjust the head open space to proper chart setting.
- 5.4** Place the stock into welding dies so wire ends meet midway between each die. Clamp into position with foot valve pedals.
- 5.5** Lower the flash guard and raise up on the operating lever until it initiates the operation switch, hold for 1 to 3 seconds to assure a complete weld cycle.
- 5.6** Unclamp welded conductors.
- 5.7** Trim off weld burr so welded area is equal to parent material diameter. Incomplete burr removal or undercutting of the weld area will result in subsequent weld breaks.

6.0 SPECIAL ADJUSTMENTS (FIG. 9.1.A)

- 6.1** Item "A" is used for head closed space adjustment. This may have to be adjusted as die and shoe inserts wear, for this reason it's best to keep like size grooves in one die set. As the ends wear they can be used until an even amount takes place then adjust closed headspace again.

When replacing worn dies with new or rebuilt ones, turn bolt "A" in about $\frac{1}{2}$ " to prevent ends from being damaged when adjusting new closed space.

To adjust new head closed space after new weld dies and clamp shoes have been installed. Lift up on hand operated air valve lever and hold in place with small wire through ears on valve body and hole in lever. Adjust bolt "A" until there is .010" between ends of weld dies. Lock bolt "A" in place with locknut.

- 6.2** Item "E" head open space adjustments.
- 6.3** Item "F" limit switch adjustment. The trip nuts should be adjusted to where plunger on limit switch is pushed down

when the dies are $\frac{1}{4}$ " apart. Make final adjustment according to welding chart. This adjustment is made with nothing in welding dies and initiating the operating lever.

- 6.4 Item "I" toggle link. This changes the vertical motion of the upset lever to a horizontal movement.
- 6.5 Item "I" upset lever. This lever pivots at the rear with air cylinder pushing front end of lever up.

7.0 PREVENTIVE MAINTENANCE TECHNIQUE

Keep in Mind that these welders are precision built to last many years, but will require good maintenance procedures. They are designed to be as automatic as possible with a minimum dependence on the ability of the operator. Those must make adjustments thoroughly familiar with the operating principles of the welders.

7.1 WELDING DIE NOTES

- 7.1.1 Welding dies and die shoes in poor condition are the primary caused of bad welds.
- 7.1.2 Check die sets for excessive wear and replace if necessary.
- 7.1.3 Clean weld die bottoms to remove oxides with emery cloth placed on a flat surface.
- 7.1.4 Clean die seats with emery cloth to brighten contact areas.
- 7.1.5 After cleaning of dies be sure to wipe off with soft clean cloth.
- 7.1.6 Completely tighten dies into seats to assure a good contact.
- 7.1.7 Worn dies will not hold stock during a weld cycle, replace worn dies.

7.2 WEEKLY

- 7.2.1 Tighten all loose parts.
- 7.2.2 Check for water leaks (if applicable).
- 7.2.3 Check for air leaks.
- 7.2.4 Drain airline filter bowls.
- 7.2.5 Tighten all loose parts.

7.3 QUARTERLY

- 7.3.1 Repeat above service items.
- 7.3.2 Check grease requirements on clamp arms pivot shafts and lubrication points.
- 7.3.3 Check anneal parts and replace all worn or broken assemblies
- 7.3.4 Check contacts on magnetic contactor for worn contacts.
- 7.3.5 Clean heat switch contacts with low residue cleaner and recoat with petroleum jelly.

7.4 ANNUALLY

- 7.4.1 Repeat previously noted items.
- 7.4.2 Check for wear in clap arm pivots.
- 7.4.3 Clean inside and outside of welder.
- 7.4.4 Check grease requirements on headpiece slide shafts, grease lightly.
- 7.4.5 Caution: make sure that power supply is disconnected before servicing welder in anyway!

7.5 WELDING DIES AND DIE SHOES INFORMATION

Description:

Welding dies - Lower conducting electrode and clamp jaw.

Welding die shoes - Upper clamping member.

Welding dies and die shoes in poor condition are the main causes of bad welds.

Care of die sets:

- 7.5.1 Use a brass or fiber blade to remove particles of flashings that build-up on die sets. Excessive flash build-up causes die burns on material and shorting of die sets.

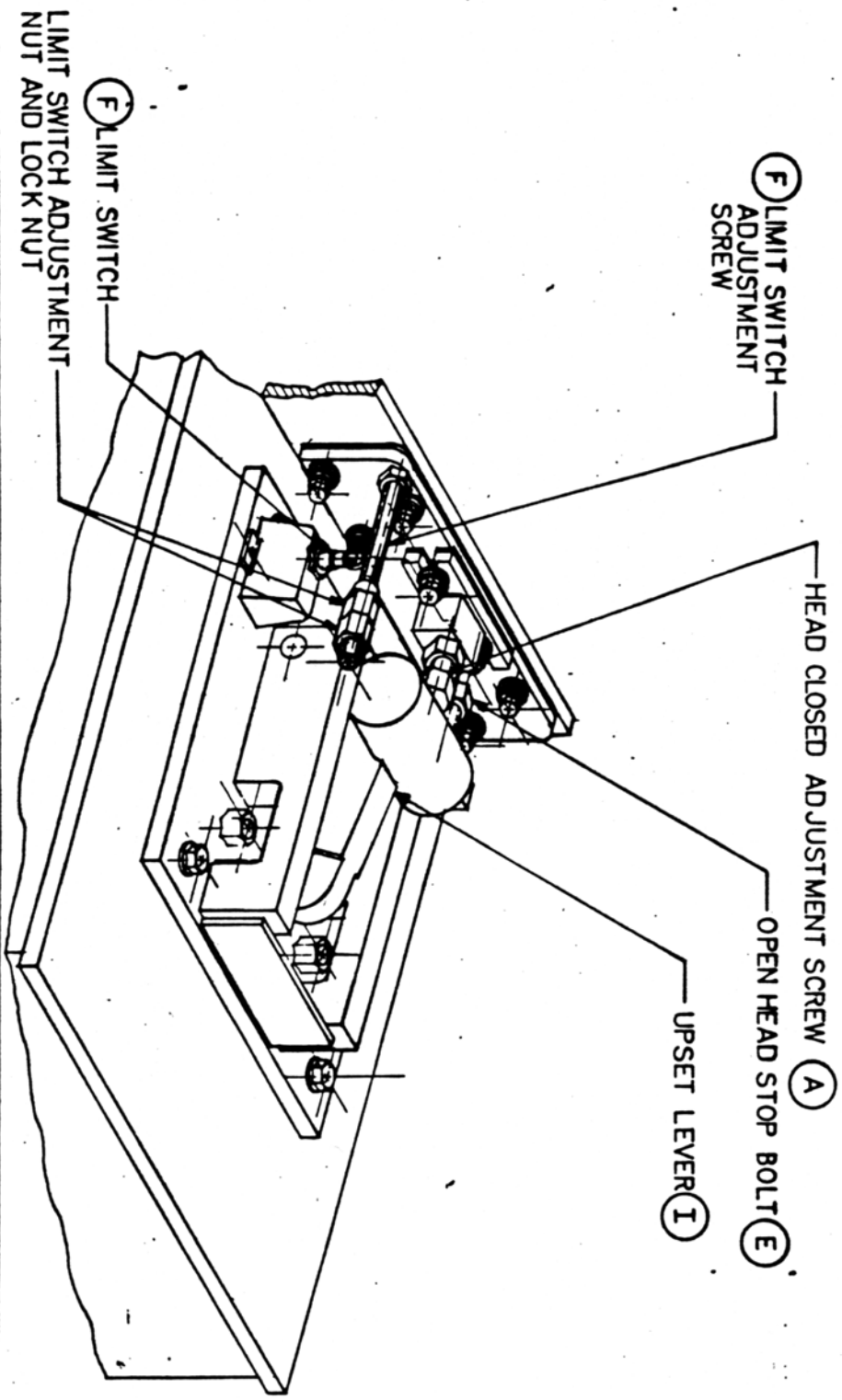
- 7.5.2** Do not attempt to clamp material that is not suited for welder into die sets. Undersize materials will slip and burn die grooves, oversize materials will overstress clamping parts.
- 7.5.3** Do not use welding die sets for a vise. These parts will not withstand the mechanical abuse.
- 7.5.4** Whenever welding dies are replaced, clean bottoms of dies and corresponding die seats to a bright and clean condition before bolting them tightly into place. An oxidized surface will insulate the welding dies and reduce effective welding voltage.
- 7.5.5** Welding die set will wear with use and must be changed occasionally for good welding results. Keep an adequate supply of replacement parts available. Wire and rod slippage is a problem caused by poor die sets and a major cause of wire breaks.

8.0 SUGGESTED SETTINGS

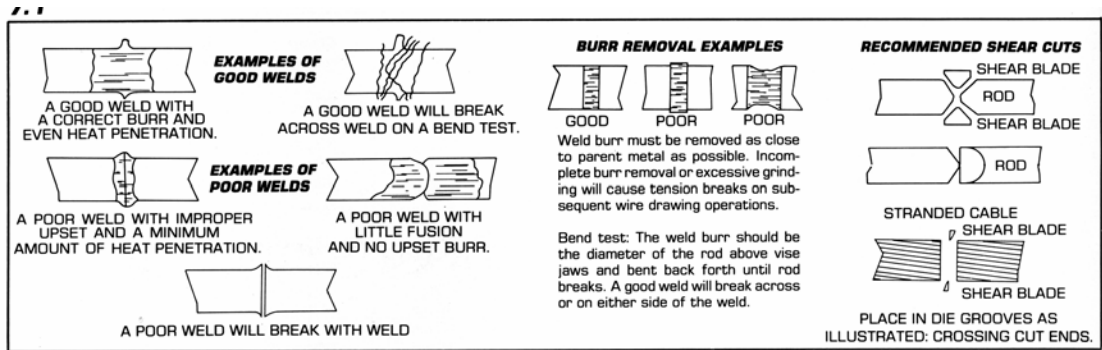
Material	Size inches	Weld Heat Setting	Die Closed Space inches	Die Open Space inches	Upset Pressure	Clamp Pressure	Limit Switch Setting	Upset Arm Movement
Model AUF-8								
Steel Rod	.500	7	.5	1.5	30 psi	90 psi	2	
Steel Rod	.750	6	.5	1.5	30 psi	90 psi	2.5	
Steel Rod	1.000	5	.5	1.5	40 psi	90 psi	3	
Steel Rod	1.312	1	.5	1.7	50 psi	90 psi	3	

9.1-A

MICRO PRODUCTS COMPANY		FILE: MODEL AUF-8 UPSET ADJUSTMENT		DRAWING NUMBER C-7771		DATE 6-10-94 MAT'L	
						DRAWN JS	
						SCALE 1 = 3	
						MCH DIMENSIONS ± (.04, .008, 1"	
						REVISIONS	
						DATE	



8.1 WELD EXAMPLES



9.0 DIAGNOSTIC CHART FOR TROUBLE SHOOTING

Welding Action	Cause	Remedy
Welding action normal burr does not extend beyond rod	Shear cut	Increase starting space
Molten metal blown out and material does not join	High heat	Lower heat setting
	Limit switch adjust	Set to depress ¼"
	Small stock	Check nameplate rating
	Low upset pressure	Increase upset pressure
	Air system	Clean air filters
Weld area does not heat enough to complete weld	Low heat	Increase heat settings
	Transformer secondary connection	Clean and tighten
	Welding dies	Clean and tighten
	Starting space	Decrease starting space
	Upset pressure	Decrease settings
Dry looking weld	Limit switch	Adjust
Misalignment of rod	Worn die grooves	Replace die sets
	Starting space	Decrease starting space
	Welder head loose	Return for reconditioning
Rod ends buckle and not welded	Weld heat	Increase heat
	Starting space	Decrease starting space
	Upset pressure	Decrease pressure
	Welding dies	Clean or replacement
Welder inoperative	Fuses	Check power supply
	Time delay switch	Check continuity of circuits
	Operating or limit switch	Check continuity of circuits
	Heat switch	Tighten loose connections
	Contactor	Check continuity of circuits
	Welding transformer	Check continuity of circuits
	Auto-transformer	Check continuity of circuits
Variations in welds	Stock slippage	Undersize stock
		Replace worn dies
		Set clamp pressure to 90 psi
		Leaking clamp cylinder
	Input voltage	Check power input
		Only 5% drop permissible
		Inadequate wiring
	Loose transformer secondary	Clean and tighten
	Loose welding dies	Clean and tight or replace
	Binding movable headpiece rod connection	Remove all rod ends
		Clean contact area
	Preparing rod end	Replace rod cutter jaws
		Require consistent cuts
	Weld contactor	Replace contacts and check operation
	Time delay switch in weld circuit	Increase air stabilization time-install timer on early units

9.1 ELECTRICAL TROUBLE-SHOOTING OF WELDER

(Caution!! Extreme care should be exercised when making these tests. Dangerous voltages are present in the welder. Only persons familiar with electrical safety precautions should perform these tests.)

9.1.1 TROUBLE-SHOOTING TABLE (See section 9.1.3)

This electrical trouble-shooting table is furnished as a suggested method of trouble-shooting the welder. The individual steps of the table should be performed in the order given, to make the tests valid. The electrical schematic (section 10) furnished for these tests show the table test points. The table may be used for welders with a different but closely related wiring by using corresponding test points. During all tests, line voltage should be connected to L1 & L2 of the welder. The heat switch should be set to the #1 position.

9.1.2 FINAL ELECTRICAL CHECKS

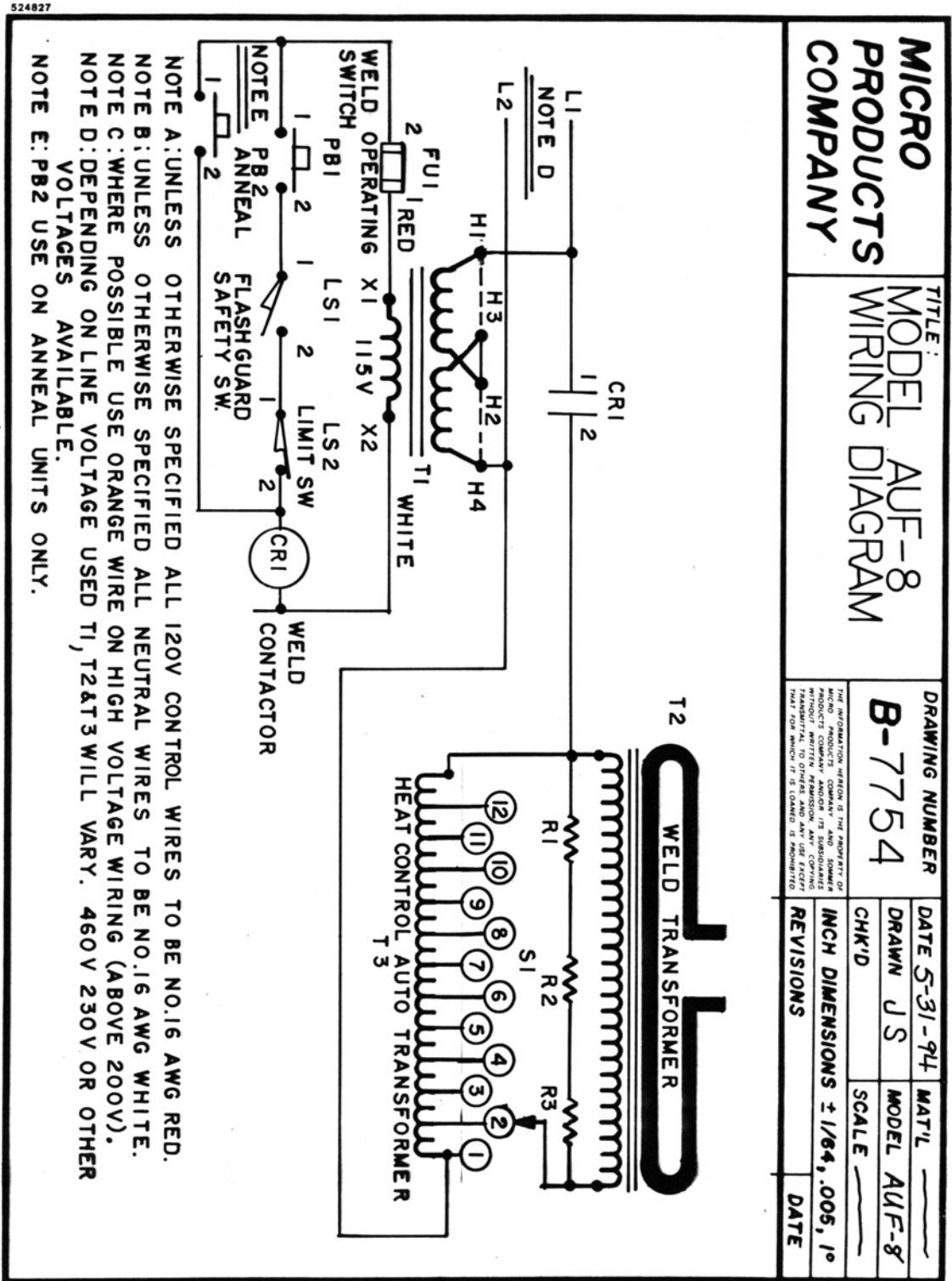
Set the heat switch to the number 1 position, connect the voltmeter across the welding dies. Press the operating switch. The meter reading will typically be less than 10 VAC. Consult the weld specification sheet for this value. Rotate the heat switch through all settings. If the voltage is not read at any setting, the heat switch may be defective. Actuate the weld limit switch; observe the reading goes to zero. Release the weld limit and operating switches, the reading should remain at zero.

9.1.3

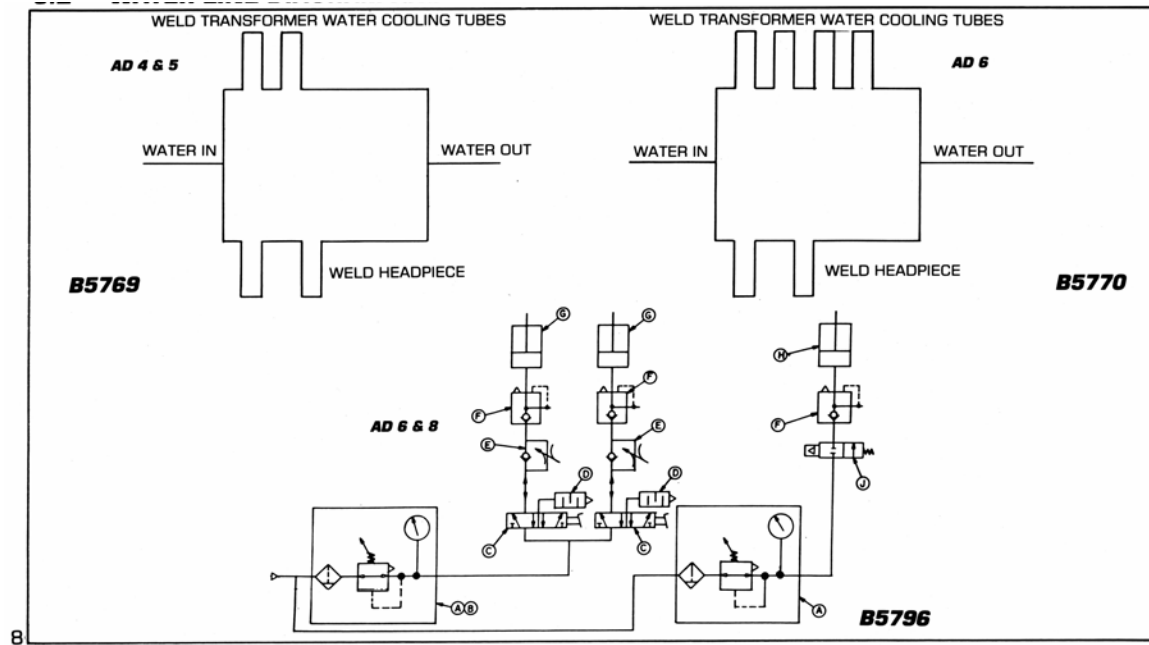
TEST LEAD CONNECTION	METER READING	PROBLEM IF NO READING	PRESS OPERATING SWITCH	WELD LIMIT SWITCH ACTUATED	PRESS ANNEAL SWITCH
X1 X2	115 VAC	Bad control transformer			
X2 FU1-1	115 VAC	Bad fuse connection			
X2 FU1-2	115 VAC	Open fuse			
X2 PB1-1	115 VAC	Open wire to operating switch			
X2 PB1-2	115 VAC	Bad operating switch	X		
X2 LS1-2	115 VAC	Open flashguard switch	X		
X2 LS2-1	115 VAC	Open wire to weld limit switch	X		
X2 LS2-2	115 VAC	Open weld limit switch	X		
X2 PB2-1	115 VAC	Open wire to anneal switch			
X2 PB2-2	115 VAC	Bad anneal switch			X
X2 CR1-Coil	115 VAC	Bad relay	X		
L2 CR1-1	Line voltage	Open wiring to contactor			
L2 CR1-2	Line voltage	Bad contactor	X		

NOTE: To perform repair consult section 13 for parts identification.

10.0 ELECTRICAL SCHEMATIC



10.1 PNEUMATIC SCHEMATIC



11.0 SAFETY REMINDERS

The following accident prevention information is presented to eliminate potential hazards while operating, inspecting or repairing Micro-Weld electric resistance welding equipment.

Important safety compliance information for Micro-Weld Welders.

GENERAL

1. Qualified personnel, prior to using equipment, must instruct an operator on basic operation and malfunction methods.
2. Safety eyeglasses must be worn by all personnel operating or servicing welders.
3. Use safety equipment properly and keep safety equipment on welders.
4. Determine that both operating voltages and hertz (cycles) of power supply correspond to ratings listed on welder nameplate located on welder housing.
5. Check nameplate ratings and keep within capacities and material categories stated therein.
6. Adjustments or repairs must be made by persons thoroughly familiar with operating principles of welder.
7. Welder must be disconnected from power supply prior to maintenance or repair procedures.

ELECTRICAL

1. Refer to National Electrical Code and local regulations for adequate electrical wiring to power welder. Do not operate welder with inadequate electrical power supply cords or cable.
2. All welders must be grounded through power supply and welder ground connection terminal securely tightened.
3. All welders must be able to be disconnected from power source either by a double breaking disconnect switch or unplugged by standard rated plugs.
4. All welders must be fused to prevent injury should an electrical malfunction occur. Welders must never be fused for an ampere load that exceeds the ratings stated on welder nameplate. Normally welders are fused using the nameplate rated load; time lag parameters functional to standard fuses allow this specification.
5. Electric power cords to welder must be kept in good condition. Report any damage or potential hazards to maintenance personnel.
6. The weld heat selection switch, potentiometer or range selection devices must not be changed to a new position while a weld operation is in process.

12.0 BUYERS GUIDE

HOW TO ORDER PARTS:

You must provide

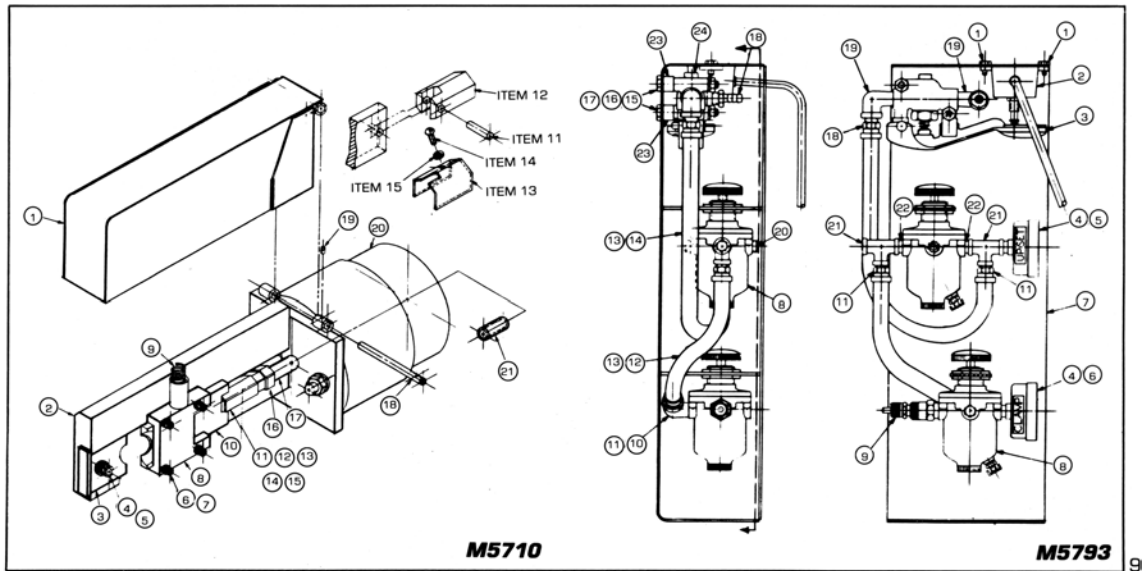
1. Machine Model
2. Machine Serial Number
3. Voltage

Then identify part(s) on part list (last page in book) and provide MICRO with the circled number.

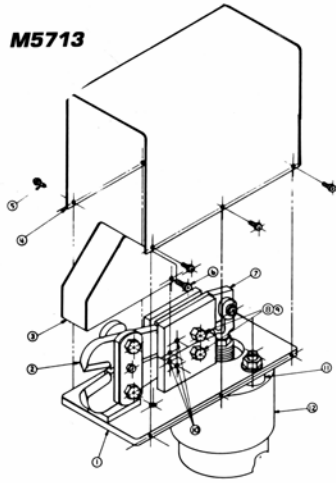
CALL MICRO at 800-872-1068
OR FAX MICRO at 630-787-9360

Provide MICRO with your company name and purchase order number.

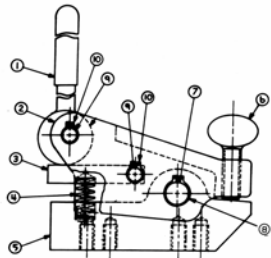
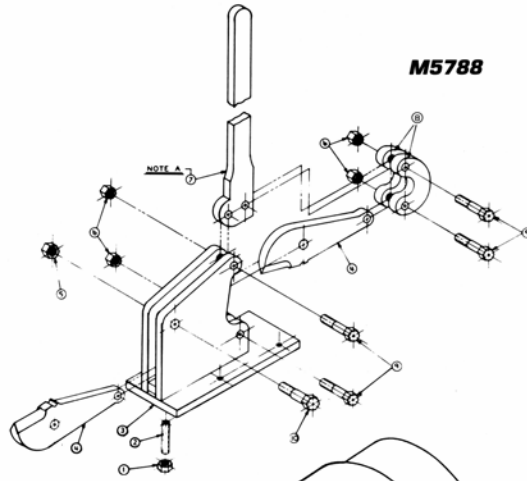
13.0 PARTS LIST



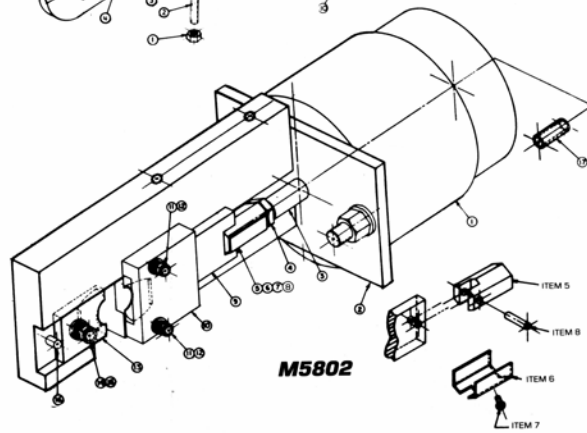
M5713



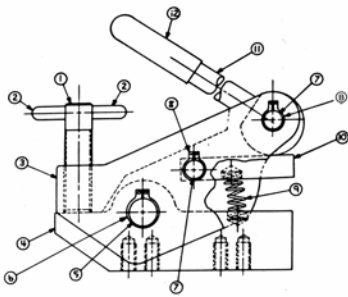
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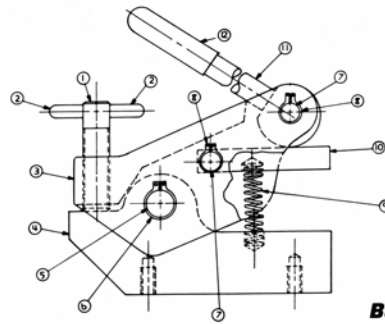
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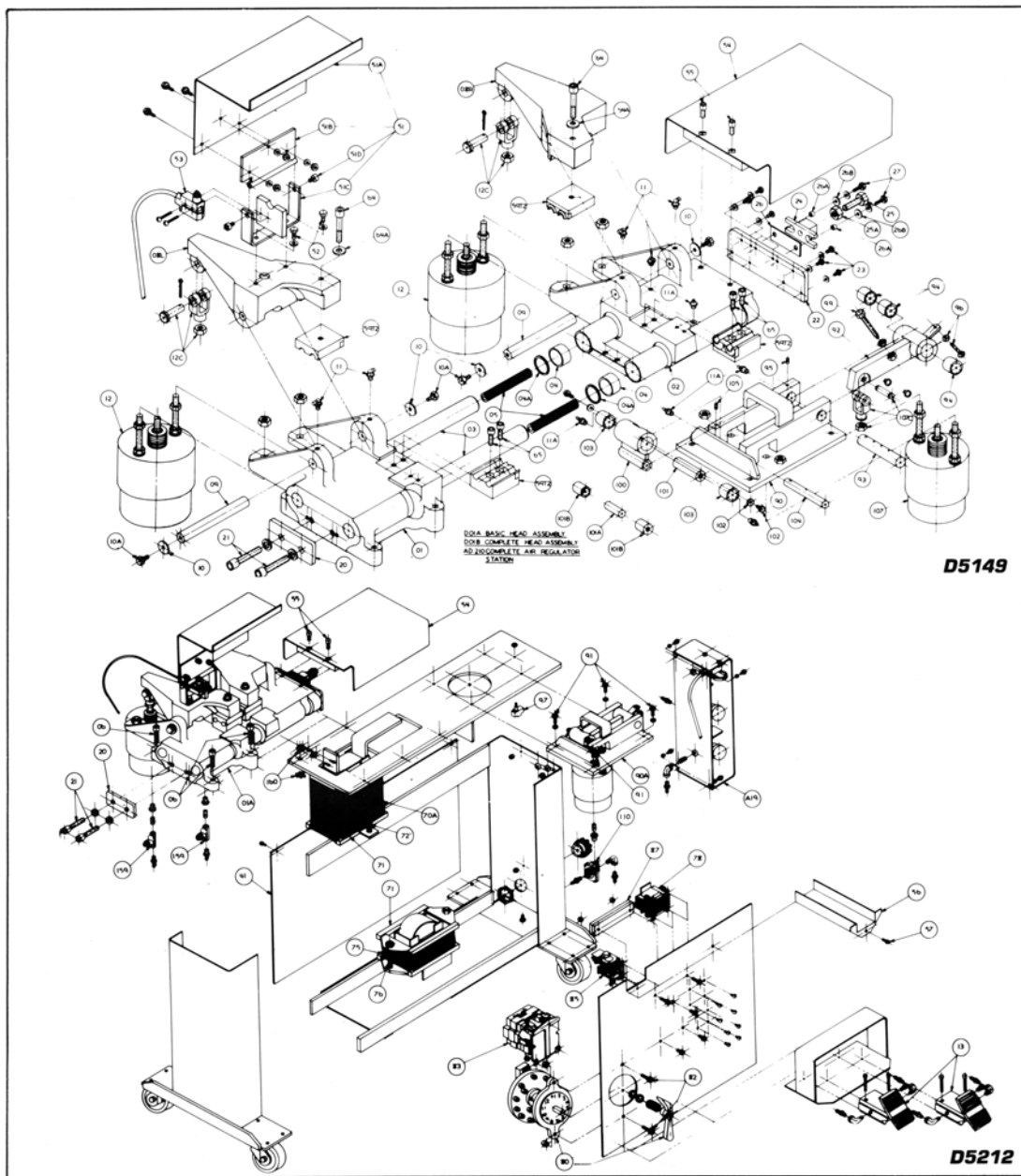
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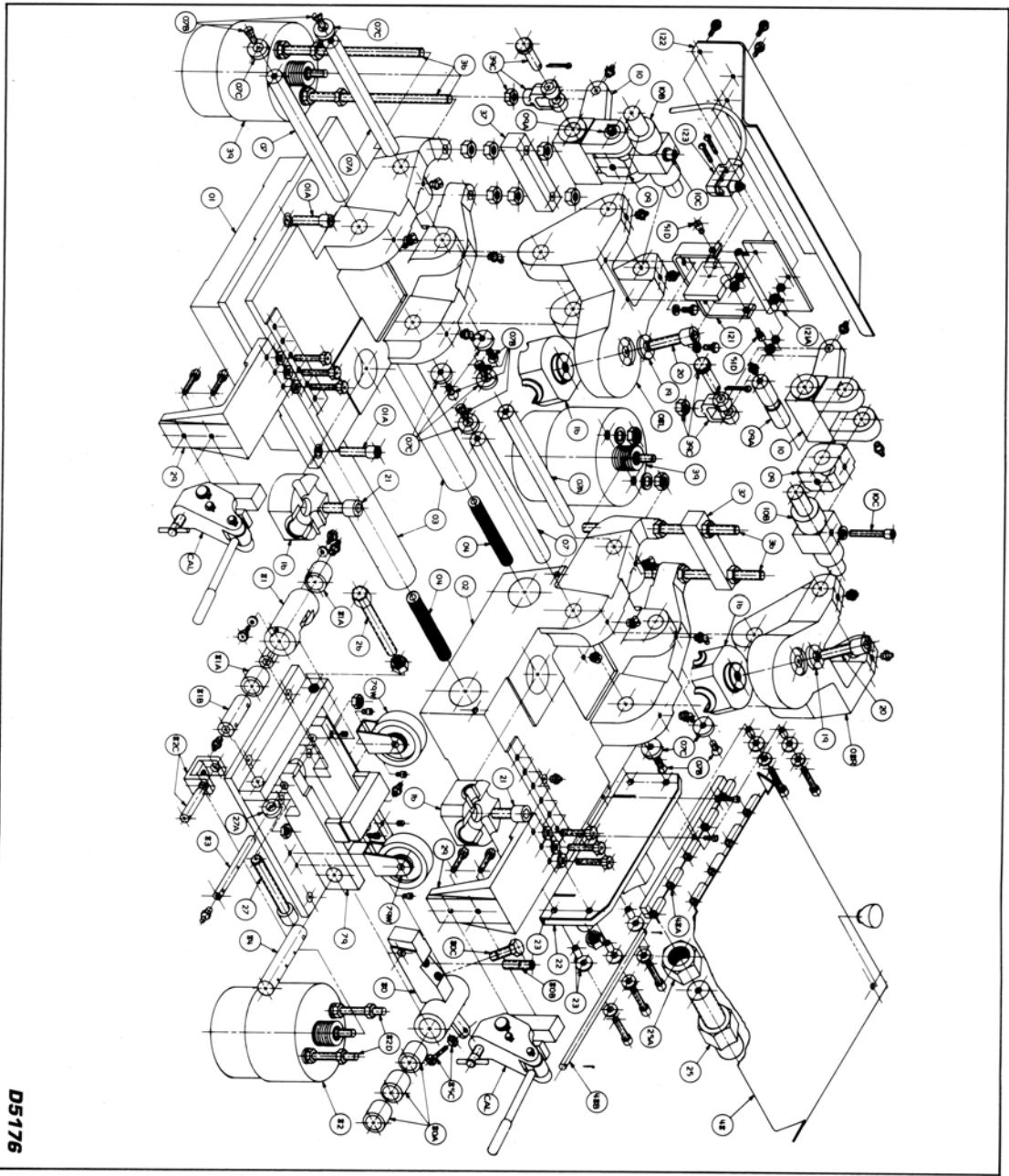
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B5781



11



D5176

